

A NEW SPECIES OF *PSEUDOMYS* (RODENTIA: MURIDAE) FROM WESTERN AUSTRALIA.

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ABSTRACT

Pseudomys chapmani sp. nov., a lithophilous rodent, is described from the Pilbara, Western Australia, and is compared to *P. hermannsburgensis* with which it is sympatric.

INTRODUCTION

Recently four rodent specimens were collected by J.N. Dunlop from East Hammersley Range, Pilbara District, Western Australia. These specimens differed in external morphology, and skeletal and dental characters from the closely related *Pseudomys hermannsburgensis*. Further specimens of this hitherto unrecognised form, here described as a new species, were located in the collections of the Western Australian Museum—including specimens from Woodstock Homestead, Pilbara, where they had been collected in sympatry with *P. hermannsburgensis*.

SYSTEMATICS

Pseudomys chapmani sp. nov.

Figs 2, a-c, 3; Table 1

Holotype

Western Australian Museum Collection (WAM) Reg. No. M18251, adult male in alcohol with skull separate, pit-trapped by J.N. Dunlop on 15 June 1979.

Type Locality: 31 km. 136° Mt. Meharry (West Angelas Mine Site) (23°11'05"S, 118°47'31"E), on stony banks edging drainage lines at interphase of shallow red earths and gibber plain. (The red earths were vegetated with *Triodia*

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Fig. 1: Type locality of *Pseudomys chapmani*: the 'drift' fence leading to the pit trap from which the holotype was collected, is in the foreground among *Triodia pungens*. (photo: J.N. Dunlop)

pungens and *T. basedowii* with scattered *Acacia aneura*, *Cassia desolata* and *C. helmsii*; the gibber plain with *Eucalyptus gamophylla*, *E. oleosa*, *C. desolata* and *C. helmsii*) (Fig. 1).

Paratypes

Mount Edgar Homestead (21°18'S, 120°04'E), M5767, adult male, skinned carcase only, in alcohol with skull separate, collected by E.H.M. Ealey on 8 October 1957.

Woodstock Homestead (21°37'S, 118°57'E), M3419, adult female, M3420, juvenile—unknown sex, skulls only, both animals dug from same 'mound, with small stones on stony ridge' by S. Barker, field numbers 16 and 16A, respectively. Date of collection not recorded but catalogued on 25 June 1959.

White Springs Homestead (21°47'S, 118°48'E), M5865, adult male, M5866-68, juvenile males, all alcohol specimens with skull separate, collected by E.H.M. Ealey 'in stony mounts' on 18 September 1956.

West Angelas (23°11'05"S, 118°47'31"E), M18242 and M18249, both adult males, and M18250, adult female, pit-trapped at type locality by J.N. Dunlop between 15-18 June 1979.

Diagnosis

A member of the genus *Pseudomys*, distinguished from all other species of this genus by a combination of its small size, large auditory bullae and short and broad palatine foramina.

Description

Comparison is made throughout with *Pseudomys hermannsburgensis* (5 ♂♂, 2 ♀♀ from Woodstock Homestead, Pilbara, Western Australia), a species with which *P. chapmani* was confused in the past (see also measurements for both species in Table 1).

Skull (Fig. 2a-c)—in *P. chapmani* rostrum more slender as a result of slightly narrower nasals and premaxillae which do not bulge laterally to extent of

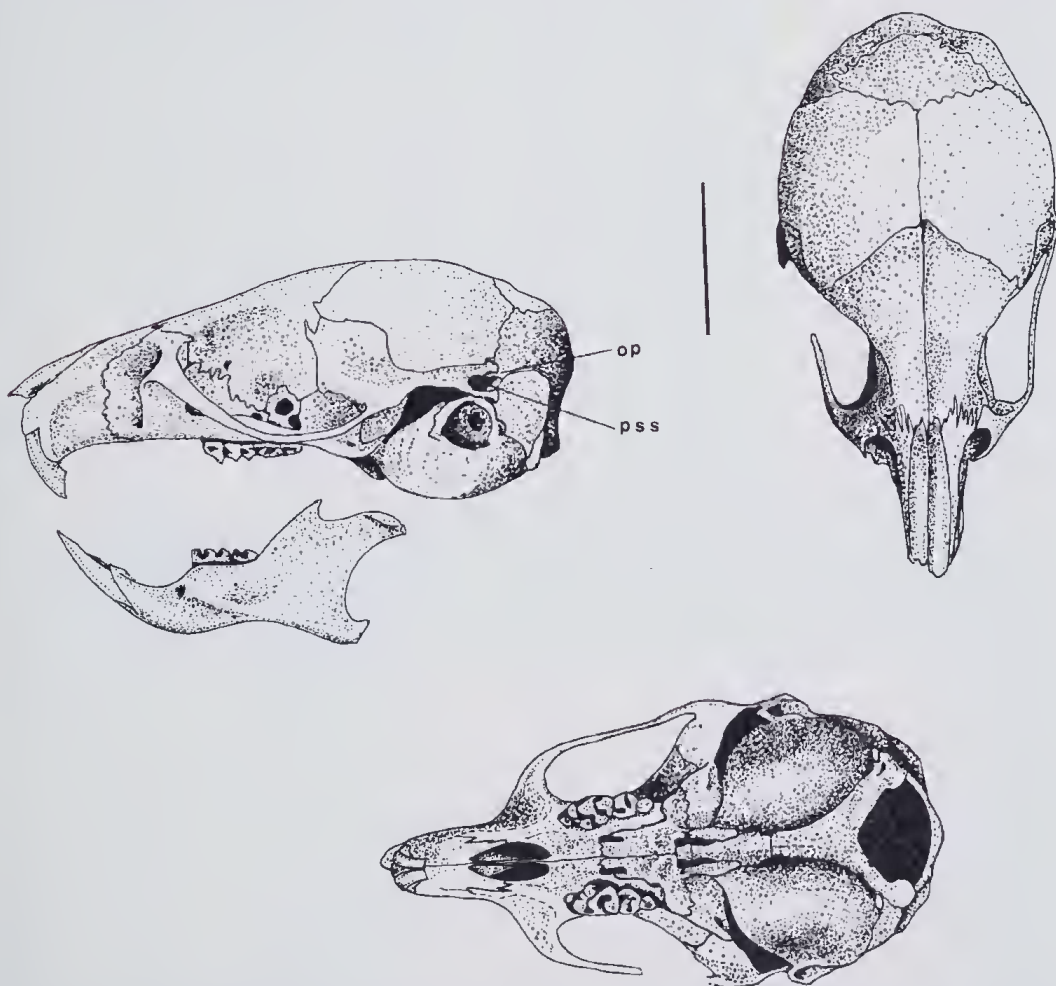


Fig 2a-c: Ventral, dorsal and lateral view of skull of holotype of *Pseudomys chapmani* sp. nov. Scale line is 5 mm. op = occipital process, pss = post squamosal sinus.

TABLE 1. Measurements in mm of holotype and paratypes of *Pseudomys chapmani* and the mean (\bar{x}), standard deviation (SD), range, and number of measurements (N) from 5♂♂ and 2♀♀. *Pseudomys hermannsburgensis*. Body measurements taken from alcohol stored specimens.

TABLE 1

Pseudomys chapmani

Catalogue number	M3419	M3420	M5767	M5865	M5866	M5867	M5868
Locality	Woodstock Homestead	Woodstock Homestead	Mt Edgar Homestead	White Springs Homestead	White Springs Homestead	White Springs Homestead	White Springs Homestead
Sex	♀	?	♂	♂	♂	♂	♂
Age	adult	juvenile	adult	adult	juvenile	juvenile	juvenile
(a) Skull/Dental							
greatest length	21.5	16.8	21.5	22.0	17.2	17.5	—
nasal length	7.3	5.3	7.2	7.6	5.1	5.1	—
nasal width	1.9	2.0	2.0	2.0	1.9	1.9	—
interorbital width	3.2	3.3	3.3	3.3	3.1	2.9	3.1
zygomatic width	11.3	9.6	11.2	11.4	—	—	9.3
mastoid width	9.0	8.4	8.8	8.9	8.3	8.1	8.1
braincase width	10.7	10.0	10.7	11.0	9.7	—	9.5
braincase depth	7.2	6.4	7.0	7.1	7.0	—	7.1
(basisphenoid to parietal)							
palatal length	10.9	9.6	11.2	11.3	8.5	8.6	8.5
ant. palatal							
foramen length	3.5	2.5	3.3	3.5	2.6	2.7	2.6
basicranial length	17.6	14.0	17.3	18.0	13.8	13.6	13.8
*bulla length	5.5	4.6	5.6	5.7	4.9	4.8	4.9
bullae width	11.2	9.1	10.6	11.1	9.2	8.9	9.0
upper molar row length	3.7	+e.i.	3.7	3.7	e.i.	e.i.	e.i.
M ¹ length	2.1	2.1	2.0	2.0	1.9	2.1	2.1
M ¹ width	1.2	1.0	1.1	1.1	1.1	1.1	1.1
M ³ length	0.7	—	0.7	0.8	—	—	—
lower molar row length	3.5	e.i.	3.5	3.4	e.i.	e.i.	e.i.
coronoid tip to angle length	—	—	—	4.6	3.5	—	3.7
condyle to incisor tip length	13.0	10.4	12.5	13.2	10.4	10.3	10.2
(b) Body							
head and body length	—	—	—	59.2	38.1	37.7	40.5
tail length	—	—	—	63.6	31.5	31.3	30.4
hind foot length	—	—	—	15.2	11.1	11.6	11.3
ear (from notch)	—	—	—	9.7	4.7	4.2	4.5
weight (gm)	—	—	—	—	—	—	—

Pseudomys hermannsburgensis

2	M18249	M18250	M18251 holotype	M3418, M5587, M5583.1-2 M7734, M5735-36			
is	West Angelas	West Angelas	West Angelas	Woodstock Homestead			
	♂	♀	♂	5♂♂, 2♀♀			
	adult	adult	adult	\bar{x}	SD	Range	N
	23.5	21.1	21.2	21.9	0.28	21.6-22.2	5
	7.5	6.4	6.9	7.5	0.33	7.2- 8.0	5
	2.1	2.0	2.0	2.2	0.08	2.1- 2.3	5
	3.4	3.4	3.4	3.3	0.20	3.0- 3.6	7
	11.6	10.8	10.8	11.3	0.23	11.0-11.6	7
	8.9	8.8	8.8	8.8	0.18	8.5- 9.0	6
	10.7	10.5	10.5	10.6	0.13	10.4-10.7	7
	7.2	7.0	6.9	6.9	0.16	6.6- 7.1	7
	12.0	10.9	10.7	11.1	0.32	10.7-11.6	7
	3.5	3.3	3.4	4.2	0.24	3.9- 4.6	7
	19.8	17.7	17.6	18.2	0.45	17.7-18.8	7
	6.5	5.7	5.7	5.0	0.15	4.8- 5.2	7
	11.0	10.7	10.6	10.5	0.18	10.3-10.8	6
	3.8	3.5	3.7	3.5	0.18	3.3- 3.8	7
	2.1	2.0	2.0	1.8	0.07	1.7- 1.9	7
	1.2	1.1	1.1	1.1	0.05	1.1- 1.2	7
	0.8	0.6	0.7	0.7	0.05	0.7- 0.8	7
	3.5	3.2	3.3	3.2	0.16	3.1- 3.5	7
	3.3	4.5	4.8	5.3	0.15	5.1- 5.4	3
	14.1	13.0	13.0	13.0	0.28	12.7-13.4	7
	65.1	52.2	56.0	58.7	3.80	56.6-64.6	6
	79.1	73.2	75.9	81.6	6.72	70.4-88.4	5
	15.4	15.1	15.2	16.7	0.41	16.1-17.0	6
	9.7	9.2	10.0	12.7	0.44	12.0-13.2	6
	12.0	7.5	9.0	—	—	—	—

* eustachian portion excluded
 + e.i. = eruption incomplete

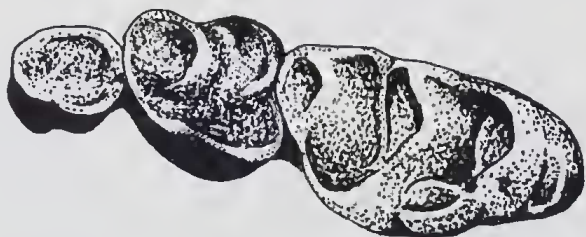
P. hermannsburgensis; nasals exceeding premaxillae; anterior edge of zygomatic plate straight and without backward inflexion at anterobasal edge of infra-orbital fissure; outline of parieto-squamosal suture strongly sigmoidal-shaped and more so than *P. hermannsburgensis*; post squamosal sinus deep, thin hook-like process of occipital intrudes along dorsal edge of sinus to about two-thirds its length (see Fig. 2c)—in *P. hermannsburgensis* this occipital process thicker, shorter and partly closes entrance of sinus; anterior palatine foramina short, broad and slightly oval-shaped, length not exceeding 3.5 mm or 32 per cent of palatal length and unlike *P. hermannsburgensis* terminating anterior to M'' alveoli, premaxillary part of median septum inflated, premaxillary-maxillary septal suture near middle; central body of presphenoid broad and flat narrowing anteriorly, with slight upward expansion encircling optic foramina; mesopterygoid fossa broad in front and not narrowing posteriorly as in *P. hermannsburgensis*, parapterygoid fossae broad and shallow with low ectopterygoids, entopterygoids project downwards, more so than in *P. hermannsburgensis*; bullae very large ranging in length in adults from 5.5 to 6.5 mm or 151 to 171 per cent of molar row length—compared to 132 to 152 per cent of molar row length in *P. hermannsburgensis*. Dentary with coronoid and condylar processes more slender and angular process with longer keel than in *P. hermannsburgensis*, these differences in shape reflected in distance between tips of coronoid and angular processes: in *P. chapmani* not exceeding 4.8 mm, and not less than 5.1 mm in *P. hermannsburgensis*.

Dentition—in *P. chapmani* upper incisors strongly opisthodont (Fig. 2c); as in *P. hermannsburgensis* laminae of molar cusps tilted backwards and labial cusps reduced; first loph of M' considerably elongated with accessory cuspule (slightly smaller than in *P. hermannsburgensis*) in all specimens except M5865 (its three presumed offspring, M5866-68, have accessory cuspules on M') (Fig. 3); first loph of M₁ bicuspid in three specimens, but to lesser degree than in *P. hermannsburgensis*, the lingual cusp being larger; m³ small.

Externals—tail slightly longer than head and body with average ratio for adults of 1:0.82 but proportionately shorter than in *P. hermannsburgensis* (1:0.72); ears much shorter than the other species; hind foot narrow, short, not exceeding 16.0 mm; large plantar pads, particularly the hallucal and fourth interdigital pads; second interdigital pad reaches anteriorly half length of third interdigital pad (cf. three-quarters length in *P. hermannsburgensis*).

Pelage and skin colour—described following Ridgway's (1912) colour

Fig. 3: Occlusal view of upper right molar tooth row of holotype of *Pseudomys chapmani* sp. nov. Scale line is 1 mm.



standard from the recently collected alcohol-preserved specimens from West Angelas, after careful drying. Predominant pelage colour on dorsal surface, including top of head, cheeks, rhinarium, arms and legs, is Avellaneous; on the back and head and rostrum this is tipped with Blackish Brown. The ventral surface of the body, including hands, feet, throat and beside the mouth, is White. The base half to two-thirds of all hairs is Deep Neutral Gray. Tail and ventral surface of feet and hands Dusky Drab, dorsal surface of feet and hands Cartridge Buff, ears Blackish Brown.

In comparison dried alcohol specimens of *P. hermannsburgensis* have a predominant pelage colour on dorsal surface of Clay Color; the ventral surface is White. The base of all hairs is Drab. Feet, hands and tail are Cream Buff. Hairs on tail about 1.5 mm long, average of 35 hairs/scale in both *P. chapmani* and *P. hermannsburgensis*.

Remarks

The genus *Pseudomys* Gray, 1832 was diagnosed by Thomas (1910) on the basis that the mammary formula of its species was $0-2=4$, with none having pectoral mammae. The skull was lightly built and without supraorbital ridges; the interorbital region was narrow, parallel-sided with rounded, or in a few species, squared edges.

Pseudomys chapmani is most similar to *P. hermannsburgensis* which was placed into the sub-genus *Leggadina* by Thomas (1910). *Leggadina* was characterised by him as having the following features: small size, straight or convex anterior zygomatic plate, narrow palatine foramina, broad and shallow parapterygoid fossae, low pterygoid processes, and molars with well-marked antero-internal cingular cusps on M^1 , molar laminae tilted backwards, and labial cusps reduced in size.

Although both Iredale and Troughton (1934) and Tate (1951) considered *Leggadina* a full genus I have followed the opinions of more recent authorities, the development of which are summarized below, in placing both *P. chapmani* and *P. hermannsburgensis* in *Pseudomys* and restricting the use of *Leggadina* to the 'forresti' group.

Originally, Thomas (1910) recognised four species within the sub-genus *Leggadina*: *P. delicatulus* (Gould, 1842), *P. hermannsburgensis* (Waite, 1896), *P. patrius* (Thomas and Dollman, 1909) and *P. forresti* (Thomas, 1906). Tate (1951) considered *Leggadina* to also include *L. waitei* (Troughton, 1932) and *L. messoria* (Thomas, 1925). Tate distinguished two main groups within *Leggadina*: the *forresti* group (also *L. waitei* and *L. messoria*) and the *delicatula* group (also *L. patria* and *L. hermannsburgensis*). Ride (1970), using Mahoney's concepts, again placed *Leggadina* as a sub-genus of *Pseudomys* and synonymised *L. forresti*, *L. waitei* and *L. messoria* under *Pseudomys forresti*. Further, he considered *L. patria* a sub-species of *Pseudomys delicatulus*. Mahoney (in Morton, 1974) subsequently believed '*Leggadina* (Thomas, 1910)



Fig 4: Entrance to *P. chapmani* burrow in mound of pebbles, from the type locality. (photo: J.N. Dunlop)

to be generically distinct from *Pseudomys*, with *L. forresti* being the type species'. Watts (1976) supports Mahoney's view that only one species is involved in Tate's (1951) *L. forresti* group but describes a second species, *L. lakedownensis* Watts, 1976, in this group. Baverstock *et al.* (1976), based on chromosomal and biochemical evidence, supported the maintenance of *Leggadina* as a separate genus 'comprising only *L. forresti* and *L. lakedownensis*.

P. chapmani has been dug from burrow systems topped with small stony mounds (see Fig. 4) on several occasions, and at West Angelas is commonly trapped nearby such mounds (J.N. Dunlop pers. comm.). Recent extensive mammal surveys within Western Australia have collected numerous *P. hermannsburgensis* over much of the arid zone outside the Pilbara but have not found any 'pebble mounds'. Ride (1970) treated *P. chapmani* and *P. hermannsburgensis* as conspecific and used the name *P. hermannsburgensis* to include both forms covered by the common names Pebblemound Mouse and Sandy Inland Mouse.

Referred Specimens

Three female alcohol-stored specimens, but with skulls missing. They have the body proportions and hind-foot pad structure of *Pseudomys chapmani* and

have the same collection data as *P. chapmani* M5865 to 68—and are probably part of the same social group. Their identity, however, cannot be absolutely confirmed because of the absence of their skulls for examination. M5864 is a female with four distended abdominal teats and probably lactating shortly before death; M5869 is a smaller but apparently adult female; and M5870 is a juvenile with body proportions similar to M5866-68.

Other Specimens Examined

Pseudomys hermannsburgensis (Waite, 1896): lectotype, Australian Museum No. M1070A, skin and skull, collected 1895 at Hermannsburg, Central Australia.

P. hermannsburgensis: CSIRO catalogue Nos Cm6032, 6058, 6061, 6063, 6065, 6074, 6078, 6375, skulls only, Central Australia.

Pseudomys hermannsburgensis bolami (Troughton, 1932): holotype, Australian Museum No. M4938, adult female, skin and skull, collected from Ooldea.

Pseudomys hermannsburgensis brazenori (Troughton, 1937): holotype, National Museum of Victoria, No. C984, skin and skull, collected from junction of the Murray and Darling Rivers on Blandowski Expedition of 1857.

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